



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

HELLINGA et al.

Appln. No. 10/686,529

Filed: October 16, 2003

FOR: BIOSENSOR

Confirmation No. 4003

Atty. Ref.: 1579-863

T.C. / Art Unit: 1645

Examiner: R.A. Zeman

* * * * *

INFORMATION DISCLOSURE STATEMENT

March 14, 2005

U.S. Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is Form PTO-1449 listing the enclosed documents (U.S. patents and patent application publications are not enclosed per 1287 OG 163). Some documents were cited in a search report for related Int'l Patent Appln. No. PCT/US2003/032581; a copy of the search report is also enclosed. No fee is required because a first Office Action on the merits has not yet been received.

This Information Disclosure Statement (IDS) is intended to be in full compliance with the rules, but should the Examiner find any part of its required content to have been omitted, prompt notice to that effect is earnestly solicited, along with additional time under 37 CFR § 1.97(f), to enable Applicants to comply fully. In particular, if any of the listed documents are missing or incomplete, please contact the undersigned who will provide another copy.

03/16/2005 SZEWDIE1 00000033 10686529

01 FC:1251

120.00 0P

926136


As provided by 37 CFR §§ 1.97(g) and (h), no inference should be made that the listed documents are prior art merely because they have been submitted for consideration. Furthermore, no representation is being made that a search has been conducted or that this statement encompasses all possible material information.

Consideration of the foregoing and enclosures, as well as the return of a copy of the Form PTO-1449 with the Examiner's initials per M.P.E.P. § 609, are earnestly solicited. The Examiner is invited to contact the undersigned if any further information is needed.

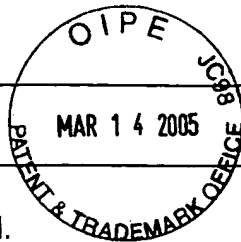
Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____


Gary R. Tanigawa
Reg. No. 43,180

1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100


**INFORMATION DISCLOSURE
CITATION**

ATTY. DOCKET NO.

1579-863

APPLICANT

HELLINGA et al.

FILING DATE

October 16, 2003

APPLN. NO.

10/686,529

GROUP

1645

(Use several sheets if necessary)

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AR	6,096,497	8/2000	Bauer			
BR	6,130,037	10/2000	Lennox et al.			
CR	6,197,534 B1	03/2001	Lakowicz et al.			
DR	6,231,733 B1	05/2001	Nilsson et al.			
ER	6,248,229 B1	06/2001	Meade			
FR	6,277,627 B1	08/2001	Hellinga			
GR	6,521,446 B1	02/2003	Hellinga			
HR	6,663,862 B1	12/2003	Hellinga et al.			
IR	2002/0004217 A1	01/2002	Hellinga			
JR	2003/0129622 A1	07/2003	Hellinga et al.			
KR	2004/0038378 A1	02/2004	Hellinga et al.			
LR	2004/0118681 A1	06/2004	Hellinga et al.			
MR	2004/0229290 A1	11/2004	Hellinga et al.			

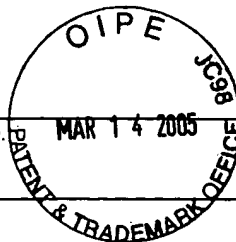
FOREIGN PATENT DOCUMENTS

	DOCUMENT	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
NR	WO 98/53849	12/1998	WIPO			
OR	WO 98/55853	12/1998	WIPO			
PR	WO 99/34212	07/1999	WIPO			
QR	WO 00/74728 A1	12/2000	WIPO			
RR	WO 03/021247 A1	03/2003	WIPO			
SR	WO 2004/36176 A2	04/2004	WIPO			
TR	WO 2004/36176 A3	04/2004	WIPO			
UR	WO 2005/07806 A2	01/2005	WIPO			

OTHER DOCUMENTS (including Author, Date, Title, Citation, etc.)

VR	Allert et al. "Computational design of receptors for an organophosphate surrogate of the nerve agent soman" Proc. Natl. Acad. Sci. USA 101:7907-7912 (2004)
WR	Benson et al. "Construction of a novel redox protein by rational design: Conversion of a disulfide bridge into a mononuclear iron - sulfur center" Biochemistry 37:7070-7076 (1998)
XR	Benson et al. "The development of new biotechnologies using metalloprotein design" Curr. Opin. Biotechnol. 9:370-376 (1998)
YR	Benson et al. "Rational design of nascent metalloenzymes" Proc. Natl. Acad. Sci. USA 97:6292-6297 (2000)
ZR	Benson et al. "Design by bioelectronic interfaces by exploiting hinge-bending motions in proteins" Science 293:1641-1644 (2001)
AAR	Benson et al. "Converting a maltose receptor into a nascent binuclear copper oxygenase by computational design" Biochemistry 41:3262-3269 (2002)
BBR	Bolon et al. "De novo design of biocatalysts" Curr. Opin. Chem. Biol. 6:125-129 (2002)
CCR	Bontidean et al. "Detection of heavy metal ions at femtomolar levels using protein-based biosensors" Anal. Chem. 70:4162-4169 (1998)
DDR	Boos et al. "Transport properties of the galactose-binding protein of <i>Escherichia coli</i> " J. Biol. Chem. 247:917-924 (1972)
EER	Brune et al. "Direct, real-time measurement of rapid inorganic phosphate release using a novel fluorescent probe and its application to actomyosin subfragment 1 ATPase" Biochemistry 33:8262-8271 (1994)

*Examiner


**INFORMATION DISCLOSURE
CITATION**

ATTY. DOCKET NO.

MAR 14 2005

APPLN. NO.

1579-863

10/686,529

APPLICANT

HELLINGA et al.

(Use several sheets if necessary)

FILING DATE

GROUP

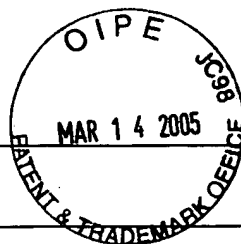
October 16, 2003

1645

OTHER DOCUMENTS (including Author, Date, Title, Citation, etc.)

AR	Careaga et al. "Large amplitude twisting motions of an interdomain hinge: A disulfide trapping study of the galactose-glucose binding protein" Biochemistry 34:3048-3055 (1995)
BR	Coldren et al. "The rational design and construction of a cuboidal iron-sulfur protein" Proc. Natl. Acad. Sci. USA 94:6635-6640 (1997)
CR	Dattelbaum et al. "Analysis of allosteric signal transduction mechanisms in an engineered fluorescent maltose biosensor" Protein Sci. 14:284-291 (2005)
DR	De Lorimer et al. "Construction of a fluorescent biosensor family" Protein Sci. 11:2655-2675 (2002)
ER	Drueckhammer "New approaches to fluorescence based glucose sensors" Database FEDRIP on Dialog, NTIS, 00313296, Identifying No. 1R21DK55234-01 - Abstract (1998)
FR	Dwyer et al. "Computational design of a Zn ²⁺ receptor that controls bacterial gene expression" Proc. Natl. Acad. Sci. USA 100:11255-11260 (2003)
GR	Dwyer et al. "Computational design of a biologically active enzyme" Science 304:1967-1971 (2004)
HR	Dwyer et al. "Periplasmic binding proteins: A versatile superfamily for protein engineering" Curr. Opin. Struct. Biol. 14:495-504 (2004)
IR	Hellinga "Metalloprotein design" Curr. Opin. Biotechnol. 7:437-441 (1996)
JR	Hellinga "The construction of metal centers in proteins by rational design" Fold. Des. 3:R1-R8 (1998)
KR	Hellinga "Computational protein engineering" Nature Struct. Biol. 5:525-527 (1998)
LR	Hellinga et al. "Protein engineering and the development of generic biosensors" Trends Biotechnol. 16:183-189 (1998)
MR	Li et al. "Comparative stereochemical analysis of glucose-binding proteins for rational design of glucose-specific agents" J. Biomater. Sci. Polymer Edn. 9:327-344 (1998)
NR	Looger et al. "Computational design of receptor and sensor proteins with novel functions" Nature 423:185-190 (2003)
OR	Marvin et al. "The rational design of allosteric interactions in a monomeric protein and its applications to the construction of biosensors" Proc. Natl. Acad. Sci. USA 94:4366-4371 (1997)
PR	Marvin et al. "Engineering biosensors by introducing fluorescent allosteric signal transducers: Construction of a novel glucose sensor" J. Amer. Chem. Soc. 120:7-11 (1998)
QR	Marvin et al. "Conversion of a maltose receptor into a zinc biosensor by computational design" Proc. Natl. Acad. Sci. USA 98:4955-4960 (2001)
RR	Marvin et al. "Manipulation of ligand binding affinity by exploitation of conformational coupling" Nature Struct. Biol. 8:795-798 (2001)
SR	Pickup "Developing glucose sensors for <i>in vivo</i> use" Trends Biotech. 11:285-291 (1993)
TR	Pinto et al. "Construction of a catalytically active iron superoxide dismutase by rational protein design" Proc. Natl. Acad. Sci. USA 94:5562-5567 (1997)
UR	Rao "Protein engineered glucose sensor" Database FEDRIP on Dialog, NTIS, 00352410, Identifying No. 1R01RR14170-01 - Abstract (1998)
VR	Rougier et al. "Use of lectin to detect the sugar components of maize root cap slime" J. Histochem. Cytochem. 27:878-881 (1979)
WR	Sloan et al. "Structure-based engineering of environmentally sensitive fluorophores for monitoring protein-protein interactions" Protein Eng. 11:819-823 (1998)
XR	Sternier et al. "De novo design of an enzyme" Science 304:1916-1917 (2004)
YR	Street et al. "Computational protein design" Structure Fold. Des. 7:R105-R109 (1999)
ZR	Tolosa et al. "Glucose sensor for low-cost lifetime-based sensing using a genetically engineered protein" Anal. Biochemistry 267:114-120 (1999)

*Examiner


**INFORMATION DISCLOSURE
CITATION**

ATTY. DOCKET NO.

APPLN. NO.

1579-863

10/686,529

APPLICANT

HELLINGA et al.

(Use several sheets if necessary)

FILING DATE

GROUP

October 16, 2003

1645

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AR						
BR						
CR						
DR						

FOREIGN PATENT DOCUMENTS

DOCUMENT	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO
ER					
FR					
GR					

OTHER DOCUMENTS (including Author, Date, Title, Citation, etc.)

HR	Vyas et al. "Crystallographic analysis of the epimeric and anomeric specificity of the periplasmic transport/chemosensory protein receptor for D-glucose and D-galactose" Biochemistry 33:4762-4768 (1994)
IR	Wilkins et al. "Glucose monitoring: State of the art and future possibilities" Med. Eng. Phys. 18:273-288 (1996)
JR	Wisz et al. "Construction of a family of Cys ₂ His ₂ zinc binding sites in the hydrophobic core of thioredoxin by structure-based design" Biochemistry 37:8269-8277 (1998)
KR	Wisz et al. "An empirical model for electrostatic interactions in proteins incorporating multiple geometry-dependent dielectric constants" Proteins 51:360-377 (2003)
LR	Yang et al. "Structural analysis, identification, and design of calcium-binding sites in proteins" Proteins 47:344-356 (2002)
MR	Yang et al. "Rational design of a calcium-binding protein" J. Amer. Chem. Soc. 125:6165-6171 (2003)
NR	Int'l Search Report for related Int'l Patent Appln. No. PCT/US2003/032581 dated June 8, 2004
OR	
PR	
QR	

*Examiner